

# Ascom IP DECT (IPBS)

INSTALLATION NOTES



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# 1 INTRODUCTION

This guide describes the setup configurations that apply when setting up Mitel MiVoice MX-ONE 6.x as well as MX-ONE Media Server on servers enabled with VMware® vSphere™ virtualization.

## 1.1 SCOPE OF THIS DOCUMENT

The aim of this document is to provide a description of MX-ONE Service Node and MX-ONE Media Server virtualization solution explaining the supported scenarios and their requirements as well as benefits and limitations. Although Mitel UC applications, such as CMG, MiContact Center Enterprise and MiCollab Advanced Messaging, included as part of the MiVoice MX-ONE 6.x solution, have also been validated in a virtualized environment, they are not covered in this document. Please refer to relevant documents for these applications where virtualization options are described.

## 2 GENERAL

This document is valid for Ascom's IP DECT (IPBS) installations.

### 2.1 SCOPE

This document describes useful information about the installation of Ascom's IP DECT (IPBS) in a MX-ONE Service Node environment.

## 3 IDLE DISPLAY

### 3.1 CHOOSING MODE

There are two options available to set the Idle display with MX-ONE user information:

- Using Call-Info header, default in MX-ONE 5.0 SP1 and earlier, see section 2.2.
- Using SIP MESSAGE (push function), introduced in MX-ONE 5.0 SP1, default from MX-ONE5.0 SP2, see section 2.3.

### 3.2 CHANGE DEFAULT OPTION CALL-INFO HEADER

The administrator can change the default option in the user agent characteristic setting in MX-ONE Service Node.

Enter the information below, do as following:

1. Log on as root on the MX-ONE Service Node using SSH.
2. Log on to the MX-ONE Service Node where IP-DECT is registering to - one or many servers.
3. Type `ssh eri_sn_admin@<telephony server>`.
4. Type change to root: `su -`.
5. Type `cd /etc/opt/eri_sn/sip_user_agents/`.
6. Type `vi ascom-ip-dect.conf`
7. Check the parameter `DiversionStatusViaCallInfo`: yes/no. If needed change to yes or no. (Yes=Default Call-Info header.)
8. If changes were made, the new information must be read by SIPLP, handling SIP extensions.
9. Type `Restart -u SIPLP -l <the LIM number of the Telephony Server>` (Note: You may check the LIM number via command, `mxone_data -p`).

### 3.3 USING CALL-INFO HEADER

When provisioning the handsets, the extension number (configured as an IP extension in MX-ONE) is tied to an IPEI value (handset identification). In this process the Idle display can be set with a relevant display name, like 55555 Adam Smith.

The base station will fetch the following diversion information from the Call-Info header in 200 OK of REGISTER, INVITE and BYE and the BYE request.

- Internal Follow-me,
- External Follow-me and
- Absence Information are supported.

Follow Me to extension 67999 is shown as: `> 67999`.

External follow me to an external number is shown as: `>`.

Absence Information is shown as: `<Absence Reason> [<return time>]`, for example: Lunch 13:00 .

## 3.4 USING SIP MESSAGE (PUSH FUNCTION)

MX-ONE will push the following Idle screens:

### 3.4.1 NEW: DEFAULT IDLE SCREEN IS SHOWN AS FOR AASTRA 6700I TERMINALS

[]- optional values

Active Profile Nr

- Shows the active Personal Number Profile. An active Personal Number can be suppressed via the bold parameter in command, `call_list_profile --change -d <dir> --call-list-npres 21`. The profile number can be changed via feature code `*10*<profile nr>#`

Name

- Show the name associated to the directory number in name database set via command, `name -i -d <dir> --number-type dir --name1 "Adam" --name2 "Smith"`

Example:

```
#1 67555
Adam Smith
```

### 3.4.2 DIVERSION INFO

Note: As earlier, the diversion, if set via the handset, must be set via on the feature codes:

- Internal Follow-me: `*21*67556#`,
- External Follow-me: `*22#00087190000#` and
- Absence Information: `*23*<absence reason code>[*<return time>]#.NEW` showing Do Not Disturb\*27#.

As MX-ONE push out a string rather than only providing diversion data (as in Call-Info), MX-ONE decided what is shown in two rows as follows.

Own directory number is 67555.

FollowMe to extension 67999 is shown as:

```
67555
> 67999
```

External follow me to an external number is shown as:

```
67555
>
```

Absence Information is shown as: `<Absence Reason> [<return time>]`. Profile is only shown

Example: Gone Home:

```
#1 67555
Gone Home
```

Example: Lunch:

```
#1 67555
Lunch
```

Example: Lunch. return at 13:00:

```
67555 Lunch
13:00
```

Example: Do Not Disturb:

#1 67555  
NotDisturb

### 3.4.3 ACTIVE CALL BACK

When a user is busy, busy services (Call Back, Intrusion etc) are available. If you press the suffix for Call Back, a call back status is shown as long as the call back is active:

Call Back  
Active



## 4 DESCRIPTION IPBS

All IPBS have 4 key functions that are enabled or disabled independently. You can activate all 4 in same IPBS but that is not recommended. The 4 functions are not aware of each other so you must point the [DECT Radio] to the [PARI Master] IP address even if they are located in the same IPBS, usually you use IP address 127.0.0.1, because that will also hint that these functions are located in the same IPBS.

IPBS key functions:

- DECT Master (if possible then avoid switching on the [DECT Radio] function on the [DECT Master] IPBS for the below described reason)
- PARI Master (if possible then avoid switching on the [DECT Radio] function on the [PARI Master] IPBS for the below described reason)
- Mobility Master (if possible then avoid switching on the [DECT Radio] function on the [Mobility Master] IPBS for the below described reason)
- DECT Radio.

### 4.1 DISABLING AND ENABLING

- The [DECT Master] IPBS, [PARI Master] IPBS & [Mobility Master] IPBS are all such a critical functions so these IPBS should have the [DECT Radio] function disabled and be placed in a 'secure' location, same goes for the standby [DECT Master] IPBS.
- Disabling the [DECT Radio] is only possible if customer has a few spare IPBS and do not need the extra radio coverage these IPBS could have provided. Customers with only a few IPBS bases can not do like this because they probably need to use all IPBS they have.
- Enabling the [DECT Radio] function is optional and means that the IPBS base station will start to provide radio coverage.
- Disabling the [DECT Radio] will disable the radio coverage and the DECT phone will not be able to detect the IPBS.

### 4.2 TECHNICAL DATA

- Max. 1000 PPs(PP=dect phone) / [DECT Master] IPBS (each [DECT Master] IPBS stores 1000 PPs, next [DECT Master] IPBS stores another 1000PPs).
- Max. 1000 [DECT Radio] IPBS / [PARI Master] IPBS (each [DECT Radio] IPBS need contact with a [PARI Master] IPBS. The [PARI Master] function has the ldap database telling where all dect phones are located, a [DECT Radio] IPBS is just a repeater, it has no knowledge of the dect phones.)
- Max. 20 000 PPs / [Pari Master] IPBS.
- Max. 100 [DECT Master] IPBS / [Mobility Master] IPBS.
- Max. 10 [Mobility Masters] IPBS / MX-ONE System.
- When the number of [Master IDs] used in the installation is between 1 to 36 then maximum 1023 [DECT Radio] IPBS / [Pari Master] IPBS can be used.
- When the number of [Master IDs] used in the installation is between 37 to 292 then maximum 127 [DECT Radio] IPBS / [Pari Master] IPBS can be used.

### 4.3 INFORMATION OF THE SET UP

- Master ID is by default 0 and is only used if any IPBS activate the [Mobility Master] function.

- The Master ID must be unique (0,1,2,3 etc.) for each [DECT Master] if they shall be controlled by the same [Mobility Master].
- In older IPBS release 2.3.11 you manually had to select the [Air Sync Master] IPBS & standby [Air Sync Master] IPBS but that was a static setting so if all [Air Sync] IPBS went down then all DECT traffic would fail.
- In newer IPBS release 3.4.13 & 5.0.11 it works differently, here all IPBS with their [DECT Radio] enabled can 'candidate' for the [Air Sync Master] function by selecting [Air Sync Master] in the IPBS, these IPBS will then report to the [PARI Master] IPBS that they are 'candidates' to be the [Air Sync Master]. The [PARI Master] will then select one of them to be [Air Sync Master] and all others will be set to standby [Air Sync Master]. This is a dynamic setup and may change any time if the relation between the IPBS are changed. The [PARI Master] is constantly monitoring the relations between all IPBS and will quickly rebuild the [Air Sync] 'tree' to suit any new configuration due to change of base stations, loss of power, temporarily bad radio coverage or whatever is causing the change. All IPBS that are setup as [Air Sync Slaves] can never become an [Air Sync Master]. All IPBS that are located in the outer rims of the radio coverage should be primarily avoided primarily never by marked as [Air Sync Master] candidates since they are not suitable for becoming an [Air Sync Master] if the PARI Master should select any one of them because the [Air Sync] tree is based on that all IPBS must be reached over the Air on as few hops between the IPBS as possible. All IPBS must be linked together by the [Air Sync] over the Air so that DECT phones can make roaming & handover.
- In newer IPBS release 3.4.13 & 5.0.11 you may need to setup multiple [Air Sync Masters], you can tell the [PARI master] function to do this by using different [Sync Regions] under the [Air Sync] Tab, you will then get one [Air Sync Master] for each [Sync Region]. If handover is needed between the sync regions you simply assign the [Reference RFPI] & [Alternative reference RFPI] to point to one of the RFPI in the other [Sync Region] that overlap the sync signal. Please note that sync signal do not need to be as high as the handover and speech signal. Sync signal can be as weak as -83 dBm while the handover limit must be stronger than -62 dBm. -83 dBm represents a much larger coverage area compared to -62 dBm. Reference RFPIs are used if you have two radio coverage areas overlapping at some place with at least -83 dBm and that use same [PARI Master] so that the [Air Sync] can be forwarded between the [Sync Regions].
- Using Reference RFPIs has the disadvantage of Resynchronization if source was disturbed. IPBS will not resync automatically because resync is a traffic disturbing action. Hence why default setting is [Resynchronize on command].

## 5 Q&A

QUESTION: The IPBS in a Network should have a RSSI better than -83 dBm ?

ANSWER: If seamless handover is required then limit is -62 dBm is the limit. If only air sync is required (no handover or roaming) then limit is -83 dBm. -83 represents a much larger coverage area compared to -62.

QUESTION: RSSI < -83 dBm will make the IPBS stop Radio traffic (cut calls and no DECT handling?) a make a synchronization restart: this will also affect the entire IPBS Network ?

ANSWER: YES, telephony functionality can not longer be guaranteed at this point.

QUESTION: Is the best RSSI between -62 dBm and -83 dBm to have roaming and handover operation in a good way?

ANSWER: NO, the RSSI MUST be -62 to -68 or better (-62 is better than -68) for seamless handover, at -68 the phone is allowed to make handover so if you want to control from and to which IPBS the phone shall be allowed to move between then be sure to keep IPBS within -68 (this is important). In other words if PP find itself at any location with all radio-visible IPBS having signal strength less than -68 then PP is allowed to pick anyone and this can then result in that PP picks a IPBS far away geographically having been reflected to reach the PP because PP doesn't know this, so the person deploying the bases should be aware of this and should keep the distance between IPBS between -62 to -68 to prevent this problem.

QUESTION: Does the Master IPBS support the connection toward the SMS server ?The SMS received from the SMS Server to the Master IPBS is sent from the Master IPBS to the IPBS where the PP is located :Over the LAN?

ANSWER: YES

QUESTION: Is it true that the Air sync problem does not have any impact on SMS and if SMS Server does not have acknowledgement within 3.5sec, then it is resent and 3.5sec again and if without ack, discarded ?

ANSWER: YES, Unite tries a couple of times to resend the message over the LAN. The Unite protocol only retries for 3.5 seconds, so if no packets is acknowledges during this time the Unite message is discarded and considered lost (this is logged). So if you have high prioritized data for a couple of seconds, and no bandwidth for the Unite protocol then you will loose packets/messages.

QUESTION: If the PP is located on a IPBS in a network that as Air Sync problem, will the SMS have problems to reach the PP ?

ANSWER: YES, Air Sync has nothing to do with the SMS getting lost since the Air Sync is not at all connected to the coverage but if you have bad coverage then SMS can get lost for the reason that signal can not reach the PP. If RSSI between IPBS is -68 dBm to -83 dBm then coverage is bad and SMS will be lost.

QUESTION: Will there be cut calls if the Air Sync is not correct everywhere in the IPBS Air Sync network and will this cause IPBS sync problems ?

ANSWER: YES, air sync problems is bad since IPBS will not be able to operate as long as there is Air Sync disturbance present (LED is flashing red).

QUESTION: Due to Air sync problem, SMS could probably not be acknowledged rapidly, and this will make the SMS server stop du to QoSRSVP windows service saturation. Master IPBS can only handle one SMS at a time.

ANSWER: Air sync problems (> -83) means that handover/roaming coverage (-62 -68) does not exist. Green air sync working ok is still no guarantee that cell size is between (-62 -68).

QUESTION: What is the SMS handling traffic capacity for IPBS without Air sync disturbance?

ANSWER: More than 10 sms/sec, the limit is in SMS server. IMS & CPDM DECT server has a switch that toggle the SMS traffic limits between 2 SMS/second(ELU31) and 10 SMS/second(IPBS) (approx).

## 6 REGARDING CRITICAL SETTINGS IN IPBS

### 6.1 IP ADDRESS

Referring to the tabs in the IPBS web gui.

- IPBS DECT MASTER and IPBS STANDBY MASTER must use fixed IP address under tab [LAN - DHCP] Mode: disabled (= meaning the DHCP is disabled)
- IPBS DECT RADIO can use either DHCP (tab [LAN - DHCP] Mode: client (= meaning that DCHP is enabled) or fixed IP address Mode: disabled

### 6.2 DEVICE NAME

Under the tab [General - Admin] a "Device Name" can be entered, this "Device Name" can be any name, preferably a name that is describing the physical location of the IPBS. The "Device Name" is used under the [Device Overview - Radios] and if you have entered the location as a name then you will get a better overview of the whole installation. The "User Name" & "Password" under [General - Admin] is the local logon credentials for that specific IPBS.

### 6.3 SYSTEM NAME

IPBS DECT MASTER decides the "System Name" & "Password" under tab [DECT - System]. The "System Name" & "Password" can be set to anything, but the same "System Name" & "Password" must be entered in all IPBS that shall be used in the same system.

IPBS DECT RADIO bases that wish to connect to the same IPBS DECT MASTER must then type in the same "System Name" & "Password"

### 6.4 AUTHENTICATION

IPBS DECT MASTER can control the [Authentication Code] under the [DECT - System] tab if the parameter [Subscriptions] is set to "With System AC". These parameter is related to when the DECT phones are subscribed.

As you type in the "Auth. Code" in the phone subscription menu you either use this same code for all DECT phones [Subscriptions] = "With System AC" or you use individual AC code for each phone and then you change the [Subscriptions] = "With User AC".

If you use individual [Subscriptions] = "With User AC" then you also must type in the "Auth. Code" individually for each user(phone) to create under tab [Users - Users] "new".

IPBS DECT RADIO can not changes these settings and so they are grayed out.

### 6.5 SUPPLEMENTARY SERVICES

IPBS DECT MASTER controls the Supplementary Services

IPBS DECT RADIO cannot change these settings and so they are grayed out.

Under the tab "Suppl Serv.", always tick the tick box "Enable Supplementary Services" to generally enable services. Then be sure to not tick any of the following next six tick boxes as then MX-ONE can control the state of diversions for the users(phones). If voicemail service, as for example MiCollab Advanced Messaging is configured, MWI Mode shall be set to activate Message Waiting Indication.

- MWI Mode: "User dependent interrogate number"
- MWI Notify Number: \*32#or<number to the voice mail system>  
\*32# is the feature code for Message Waiting which is a general feature for messages from Operator, individuals or a voice mail system.

## 6.6 DECT MASTER OR DECT RADIO

Under tab [DECT - Master] you decide if IPBS shall become a DECT MASTER or a DECT RADIO.

Select "Mode: Off" and the IPBS will become a DECT RADIO.

Select "Mode: Active" and the IPBS becomes a DECT MASTER.

Select "Mode: Standby" and the IPBS will become a DECT STANDBY MASTER. (only one IPBS can be a standby Master and it must have the same settings as the active Master)

Select "Mode: Deployment " and the IPBS will become a Site Survey Tool.

Note that if the active Master is the sole Air Sync Master in the system then the standby Master must also be an Air Sync Master or else system will not work if the standby Master needs to take over the role as the active Master.

## 6.7 DECT MASTER

### 6.7.1 PROTOCOL

IPBS DECT MASTER controls type of protocol used towards MX-ONE. under tab [DECT - Master] the parameter "Protocol" must always = "SIP".

IPBS DECT RADIO can not changes these settings and so they are grayed out.

### 6.7.2 PROXY

IPBS DECT MASTER controls the connection to the Proxy under tab [DECT - Master], enter the IP Address of the MX-ONE Service Node LIM you which to use as Proxy.

IPBS DECT RADIO can not changes these settings and so they are grayed out.

### 6.7.3 ENBLOC DIALING

Enbloc dialing is the supported way of dialing in MX-ONE for SIP. It means that the complete number is sent in the INVITE

### 6.7.4 REGISTRATION TIME-TO-LIVE

IPBS DECT MASTER controls number of registrations per second. This parameter is adjustable depending on load, if there are many phones you might want to keep this value low just in-case all phones needs to do registration at the same time

Generally starting from the default value you can carefully decrease the TTL timer value to make the time shorter for smaller installations with less IP extensions. If you change it then do it in small steps. And the other way around generally starting from the default value you can carefully increase the TTL timer value for larger installations with more IP extensions to decrease the processor load on the MX-ONE Service Node. Same here change the value in small steps.

Too short time period for TTL will cause to high CPU load.

Too long time period for TTL will cause IP extension not reachable if they loose contact with server before TTL timer allows the IP extensions to re-register again.

IPBS DECT RADIO cannot change these settings and so they are grayed out.

### 6.7.5 REGISTER WITH NUMBER

IPBS DECT MASTER controls how the IP extensions in IPBS shall register to MX-ONE with parameter "Register With Number" under tab [DECT - Master]. This parameter is related to which one of the two parameters "Name" & "Number" that will be user in the registration process between IPBS and MX-ONE. The parameters "Name" & "Number" are programmed under tab [Users - Users] "new".

So if you toggle the box "Register With Number" then the parameter "Number" under [Users - Users] "new" will be used when the IP DECT phone registers towards the Proxy.

IPBS DECT RADIO cannot change these settings and so they are grayed out.

## 7 RADIO TRANSMITTER

It is possible to disable the radio transmitter in the IPBS under tab [DECT - Radio] by ticking the "Disable" tick box. This can be desirable for a number of reasons, for example if testing multiple systems to keep them from interfering with each other or just keeping a DECT MASTER safe from harms way by installing it in the relativity safe exchange room and switch off the radio on it. Remember to set another IPBS as synch master if the IPBS DECT MASTER was the only synch master as the radio is disabled.

## 8 LINKING DECT RADIO TO PARI MASTER & STANDBY MASTER

IPBS DECT RADIO must specify to which PARI MASTER it shall connect to in parameter "PARI Master IP Address" under tab [DECT - Radio].

Here you can also see the [status] telling if the DECT RADIO base is connected or not, to the PARI MASTER. Critical parameter for successful connection here is that the same "System Name" & "Password" are used in both DECT MASTER and DECT RADIO.

IPBS DECT MASTER leaves the parameter "Master IP Address" empty under tab [DECT - Radio]. It will then change to 127.0.0.1 which is correctly indicating that it is the DECT MASTER.

Parameter "Standby Master IP Address" under tab [DECT - Radio] is used for all IPBS if there is an IPBS present acting as a STANDBY SERVER.



## 9 PARI & SARI

IPBS DECT MASTER controls the PARI and SARI parameters.

Changing PARI is only needed if there are other interfering IP-DECT system PARIs visible in the RFP Scan under the tab [Diagnostics - RFP Scan]. The scan function is only available in an IPBS DECT MASTER base.

SARI code is unique and shipped with the IPBS system in an envelope.

IPBS DECT RADIO cannot change these settings and so they are grayed out.

## 10 SMS

IPBS DECT MASTER controls the connection to SMS server under tab [DECT - SMS].

Enter parameter "IMS IP Address" pointing to either CPDM or IMS or other SMS system.

IPBS DECT RADIO can not changes these settings and so they are grayed out.

## 11 LDAP

LDAP is very central, the IPBS will not operate without it. IPBS DECT MASTER use LDAP server to store all the dect extensions you create under tab [User - User]. The LDAP function is implemented in differently:

FOR IPBS SW 2.3.11 ONLY

- IPBS 2.3.11 DECT MASTER must either set-up own LDAP server or point to external LDAP server in tab [LDAP - Server], if using own LDAP server then any desired User and Password can be specified in tab [LDAP - Server], also tick the tickbox to enable Write Access.
- All 2.3.11 IPBS DECT RADIO bases must use same User & Password under the tab [LDAP - Replicator]. Enable the Replicator service by ticking the [Enable] tickbox, look in tab [LDAP - Replicator-status] so ldap replication was successfully executed ("Up" & "Completed").
- Optionally another 2.3.11 IPBS can be programmed to become a standby LDAP Server, preferably with fixed IP Address, in this case create one more LDAP user in that IPBS and enter IP Address 0.0.0.0 in parameter "Alt Server" under tab [LDAP - Replicator] in this IPBS. In all other IPBS the IP Address of this IPBS is given under the same parameter "Alt Server" under tab [LDAP - Replicator].
- If you only have one IPBS then that IPBS must be DECT MASTER and then that IPBS will also become the LDAP master and you will not notice the LDAP because it runs in the background. But if you hook up one or more IPBS DECT RADIO bases on the MASTER base then all those DECT RADIO bases must get the LDAP data base replicated from the LDAP master, DECT RADIO bases replicates this data from the LDAP server in the DECT MASTER base. Without the data from LDAP the IPBS DECT RADIO bases will not operate. All this replication is causing a lot of network traffic in 2.3.11 so in newer release 3.4.13 & 5.0.11 this LDAP replication between DECT MASTER and DECT RADIO has been removed, however replication between DECT MASTER and standby DECT MASTER must still be setup if a standby DECT MASTER is used to the parameters are still present but they are not used for the DECT RADIO IPBS any more in newer IPBS release 3.4.13 & 5.0.11.
- FOR IPBS SW 3.4.13 & 5.0.11 ONLY LDAP settings no longer needs to be manually setup between all the DECT RADIOS and the DECT MASTER if system is not using any standby DECT MASTER. LDAP is fully automatic in this case. However if the system use a standby

## 12 VOIP OPTIONS

On the left, choose “VoIP” to for SIP characteristics.

- IP-PBX Supports Redirection When Registering To Alternative Proxy: This should be enabled when Extension Registration Distribution ( command: extension\_registration\_distribution) is enabled.
- Prefer P-Asserted-Identity As Calling Party Identity: This should always be enabled to ensure correct display info in cases of redirection and busy service responses.